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ABSTRACT

This bibliography is an effort to sort through the mathematical literature that is available. It categorizes the books into the main strands found in most elementary mathematics curricula or scope and sequence charts. These strands are: sets and numbers; measurement and geometry; and graphs, functions, and probability. These are supplemented in this bibliography with three other categories: calculators and computers; general knowledge; and biographies and personalities. In an attempt further to refine the list for easier reference, each of the categories is divided into pre-primary, primary, intermediate, and adult resource areas. (Author/MK)

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ANNOTATED BIBLIOGRAPHY OF CHILDREN'S LITERATURE RELATED TO ELEMENTARY SCHOOL MATHEMATICS CURRICULUM

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AN ANNOTATED BIBLIOGRAPHY OF CHILDREN'S LITERATURE RELATED TO THE ELEMENTARY SCHOOL MATHEMATICS CURRICULUM

Division of Instructional Media
Indiana Department of Public Instruction
Harold H. Negley, Superintendent

September 1979

FOREWORD

In these days of emphasis on reading and comprehension it is important to realize the effect this has on other content areas. It has always been difficult to "read" a mathematics text. Therefore, it is imperative that we make use of alternative sources of information to support concepts, provide enrichment, and give background to parents and teachers. This publication is an important step in the recognition of the adaptability of a myriad of materials to the area of mathematics. Elementary educators are encouraged to take advantage of this annotated bibliography.

Tom Clark
Mathematics Consultant
Indiana Department of Public Instruction

In recent years many school corporations have used Elementary and Secondary Education Act, Title IV-B funds to supplement the school curriculum in a cycle that follows textbook adoption. As the year for mathematics adoption approaches, it is the intent of the Department of Public Instruction to call attention to children's books that may be used in the mathematics curriculum. Oftentimes materials in the school media centers are not used to their potential as curricular support. It is anticipated that this bibliography will be used in the consideration for purchasing and in identifying uses for titles already located in the school.

Phyllis Land, Director
Division of Instructional Media
Indiana Department of Public Instruction

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ACKNOWLEDGMENTS

ESEA Title IV-B, Public Law 93-380 Administration funds were used to publish this document. The Division of Instructional Media of the Indiana Department of Public Instruction contracted with M. Bernadine Tabler, experienced in elementary mathematics teaching and children's literature, so that this unique bibliography could be available to Indiana Schools.

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Introduction

The basic objective of teaching elementary school mathematics is to develop the concepts necessary to help a person cope with the environment. Mathematics, according to Piaget, Bruner and others, should be introduced with concrete objects. However, other kinds of experiences, available only through reading, can help in expanding and enriching one's background in mathematics. Reading well-written books can also influence affective behavior through stimulating interest in, and creating a positive attitude toward, mathematics.

A wealth of mathematical literature has become available to us during the past twenty years. The purposes for which these books are written vary. Some support the instruction of curriculum topics. Others provide enrichment topics beyond those which are ordinarily studied in the basic course of studies. A third category provides the teacher or parent with background in the field of mathematics.

Even though there is an abundance of reading resources available in mathematics, teachers have not typically exploited it. Probably the most prevalent reason is that they are simply not aware of the materials published in this field. When the sources are known to them, it is more than likely that they may not have the time to evaluate them thoroughly. Teachers need access to information about which materials are mathematically accurate and well written. Finally, in order for these books to be useful to their

students, teachers must know what background knowledge is necessary for students to benefit from them.

Curriculum Areas

This bibliography is an effort to sort through the mathematical literature available to us. In the first place it categorizes the books into the main strands found in most elementary mathematics curricula or scope and sequence charts. Those strands are: sets and numbers; measurement and geometry; and graphs, functions and probability. These are supplemented in this bibliography with three other categories: calculators and computers; general knowledge; and biographies and personalities. Explanations of the specific topics included in each category are outlined in the Table of Contents.

Levels

In an attempt to further refine the list for easier reference, each of the categories is divided into pre-primary, primary, intermediate, and adult resource areas. This breakdown was made on the basis of the usual placement of topics in textbooks and curriculum guides. It should be applied liberally, and perusal of both the primary and intermediate lists, for any grade level, is strongly suggested. Those books which encompass the entire range of grades have been placed at the level in which a majority of the topics correspond.

Adult resource books are largely for parent or teacher assistance. Use of books in this category by mathematically talented

students should also be entertained. These books provide background information, introduce new topics, and generally give an overview of the interrelatedness of various topics. In some instances they provide insights into how children learn math concepts. This area is limited to books written for those who are not specifically trained in teaching. (Inclusion of teaching books would constitute a sizeable bibliography in and of itself.)

Annotations

A summary of the main topics covered in the book is provided to give some insight into the background knowledge necessary for comprehension of the ideas presented. Particular attention has been given to the accuracy of the presentation. Any unique or particularly strong points are also included in the summary. The picture books, in the number and geometry strands, are more briefly summarized with only a short description of the concepts covered.

Explanation of Symbols

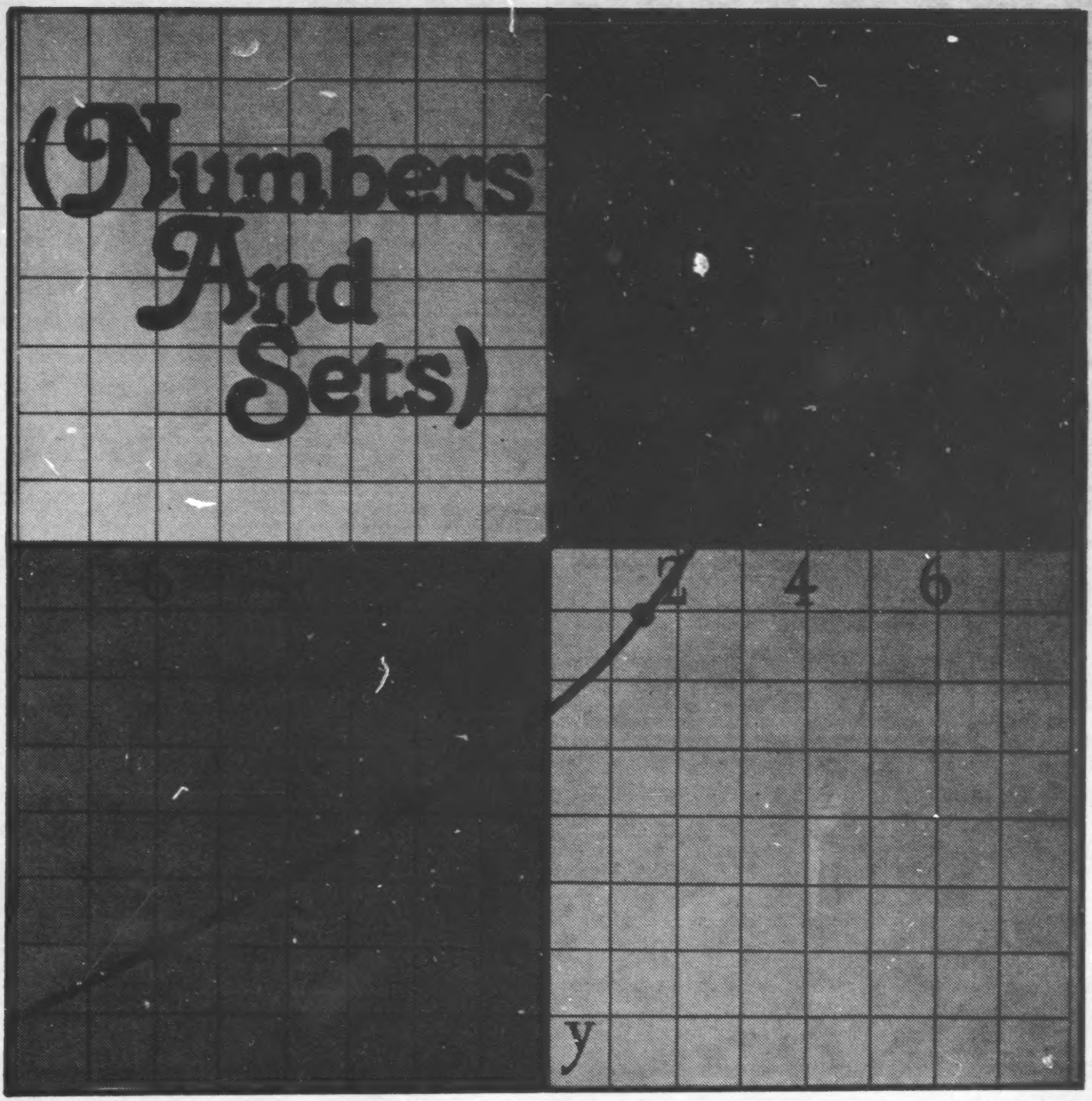
The books on this list can be utilized in many ways. Two different categories are suggested here. For category I the books will most frequently lend themselves to supporting the curriculum. They can be used for an introduction, review, or remediation of the content found in most mathematics programs.

Books in category II can be characterized as extra-curricular. The topics discussed often go beyond that which is offered in most curricula. These books can be used for enrichment on all levels.

They can profitably occupy the extra time of the gifted or talented student. Average students can develop new interests and benefit through exposure to topics different from those used in the classroom. Also, enrichment for the unmotivated and underachiever should not be overlooked. Opportunities to succeed with new topics can break the failure syndrome and lead to the feeling that math can be fun. Most books in categories I and II are readily adaptable to learning centers and individualizing as well as for group instruction.

The final element of each entry is an assessment by the compiler of the overall value of each book. The highly recommended books (HR) are those which are attractive, are up-to-date, provide a clear presentation of subject matter, are scrupulously accurate, have illuminating illustrations, contribute to conceptual development and stimulate curiosity to pursue the subject matter further. Those which lack some of these qualities, but can still be effectively utilized by most students, are simply recommended (R).

It is hoped that this bibliography can be used by teachers, librarians, parents and students. It should demonstrate that books can be used in mathematics classes to give information, to investigate new topics, to integrate math into our everyday lives, to encourage children to read, and to help children enjoy math.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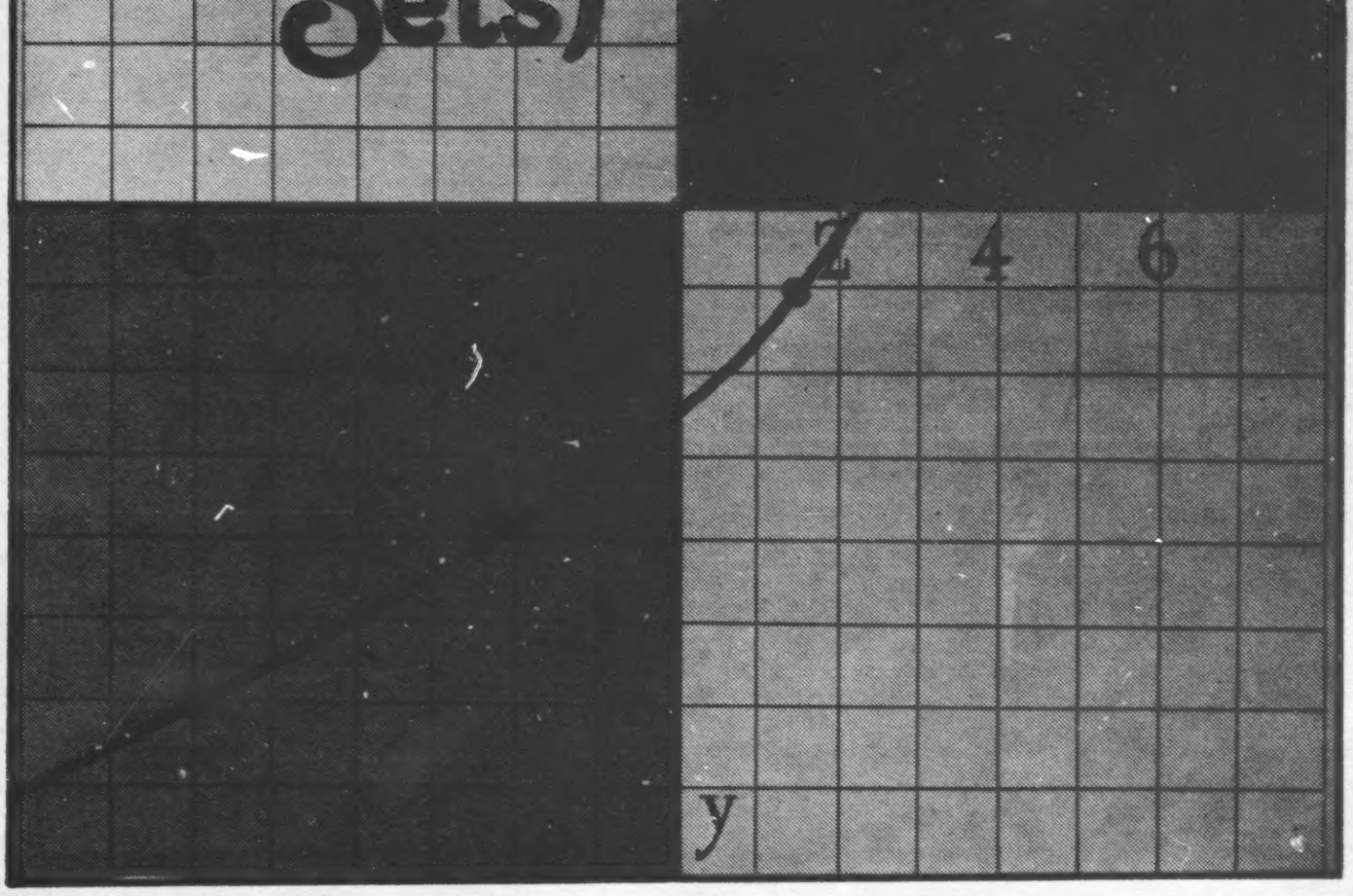


GEOMETRY AND MEASUREMENT

Pre-Primary and Primary Picture Books

Budney, Blossom. A Kiss Is Round. Illustrated by Vladimir Bobri. New York: Lothrop, Lee and Shepard Company, 1969.

I - R Circle, square, oval.

Epstein, Sam and Beryl. Who Needs Holes? Illustrated by Tomie De Paola. New York: Hawthorne Books, Inc., 1970.

I - HR Circles.

Hoban, Tana. Circles, Triangles, and Squares. New York: Macmillan Publishing Company, Inc., 1974.

I - R Circle, triangle, square.

Hoban, Tana. Push, Pull, Empty, Full. New York: Macmillan Publishing Company, Inc., 1972.

I - R Opposites.

Kohn, Bernice. How High Is Up? Illustrated by Jan Pyk. New York: G.P. Putnam's Sons, 1971

I - HR High, low, bottom, big, small.

Lionni, Leo. Inch by Inch. New York: Astor-Honor, Inc., 1960.

I - HR Inches.

Reiss, John J. Shapes. Scarsdale, New York: Bradbury Press, Inc., 1974.

I - R Squares, cubes, triangles, pyramids, circles, spheres, rectangles, ovals, pentagons, hexagons, octagons.

NUMBERS AND SETS

Pre-Primary and Primary Picture Books

Anno, Mitsumasa. Anno's Counting Book. New York: Thomas Y. Crowell Company, 1975.

I - HR 1-12.

Brenner, Barbara. The Five Pennies. Illustrated by Erik Blegvad. New York: Alfred A. Knopf, 1964.

I - R 1-5.

Carle, Eric. 1, 2, 3 To the Zoo. Cleveland, Ohio: Collins-World, 1968.

I - HR 1-10.

Carle, Eric. The Very Hungry Caterpillar. Cleveland, Ohio: Collins-World, 1970.

I - HR 1-15.

Elkin, Benjamin. Six Foolish Fishermen. Illustrated by Katherine Evans. Chicago: Children's Press, 1957.

I - R One - six first - sixth.

Francoise. Jeanne-Marie Counts Her Sheep. New York: Charles Scribner's Sons, 1951.

I - R 1-7.

Gag, Wanda. Millions of Cats. New York: Coward, 1928.

I - HR Intuitive approach to relative values of large numbers.

Gretz, Susanna. Teddy Bears 1 to 10. Chicago: Follett Publishing Company, 1969.

I - HR 1-10.

Ipcar, Dahlov. Brown Cow Farm. Garden City, New York: Doubleday and Company, Inc., 1959.

I - R 1-10, 20, 30, 40, 50, 60, 70, 80, 90, 100.

Kruss, James. Three by Three. Translated by Geoffrey Strachan. Illustrated by Eva Rubin. New York: The Macmillan Company, 1965.

I - R 1-3.

Langstaff, John. Over in the Meadow. Illustrated by Feodor Rojankovsky. New York: Harcourt, Brace and World, Inc., 1957.

I - R Rhyme for one - ten.

Martin, Bill and Peggy Brogan. Sounds of Numbers. New York: Holt, Rinehart and Winston, Inc., 1972.

I - R Collection of rhymes.

Oxenbury, Helen. Numbers of Things. New York: Franklin Watts, Inc., 1968.

I - HR 1-10, 20-50.

Peppe, Rodney. Circus Numbers. New York: Delacorte Press, 1969.

I - R 1-10, 20, 100.

Sendak, Maurice. One Was Johnny. New York: Harper and Row, 1962.

I - R 1-10.

Showers, Paul. How Many Teeth? Illustrated by Paul Galdone. New York: Thomas Y. Crowell Co., 1962.

I - R 1-32.

Stiles, Norman. The Count's Number Parade. Illustrated by Joe Veno. New York: Western Publishing, Inc., 1977.

I - R 1-10, one - ten.

Tudor, Tasha. 1 Is One. New York: Henry Z. Walch, Inc., 1956.

I - R 1-20, one - twenty.

Vogel, Ilse-Margaret. 1 Is No Fun But 20 Is Plenty! New York: Atheneum, 1967.

I - R 1-20.

Wildsmith, Brian. Puzzles. New York: Franklin Watts, Inc., 1970.

I - HR Discrimination and counting to 12.

Ziner, Feenie. Counting Carnival. Illustrated by Paul Galdone. New York: Coward-McCann, Inc., 1962.

I - R 1-12.

Zolotow, Charlotte, One Step, Two . . . Illustrated by Roger Duvoisin. New York: Lothrop, Lee and Shepard Company, 1955.

I - R One - twelve.

Primary

Adler, Irving and Ruth. Sets and Numbers. Illustrated by Peggy Adler. New York: The John Day Company, 1969.

I - HR Beginning number concepts introduced: 1-10, sets, matching more and fewer, subsets, ordinal numbers, counting. Complements beginning math program. Student involvement on every page. Consistent with current learning theory. Pictorial approach.

Allen, Robert. Numbers. Illustrated by Mottke Weisman. New York: Platt and Munk, 1968.

I - HR Excellent color photographs of objects from child's environment to illustrate one through ten. Text then suggests the child practice counting. Piagetian tasks given in conservation of numbers via pictures. Also brief introduction to combining sets.

Budney, Blossom. A Cat Can't Count. Illustrated by William Wondriska. New York: Lothrop, Lee and Shepard Company, Inc., 1963.

I - R Rhymes and pictures and number/words for counting to 10. Students count in several activities. Pictures clear and attractive. Also introduction to other measurement: scales, clocks, calendars, meters. Only inaccuracy on last page with three-digit numbers divided between lines.

Carle, Eric. The Rooster Who Set Out to See the World. New York: Franklin Watts, Inc., 1972.

I - HR Picture book of rooster who collects animals on his walk. Each group is added to the others in small pictures near the text. When night arrives each group leaves. Colorful illustrations in impressionistic style. Intuitive approach to addition and subtraction.

Carona, Philip. Numbers. Illustrated by Mary Gehr. Chicago: Children's Press, 1964.

II - HR One of University of Chicago Laboratory School Books. Consistent with Dewey philosophy. A history of development of numbers. Describes how symbols developed. Shows necessity of concept of zero and place value. Gives reader sense of place in history.

Dennis, J. Richard. Fractions Are Parts of Things. Illustrated by Donald Crews. New York: Thomas Y. Crowell Company, 1971.

I - R Fractions of objects and sets: 1/2, 1/3, 2/3, 1/4, 3/4. Uses typical and less common partitions of sets and objects. Includes activities for reader. From very simple to complex diagrams. Would not recommend for introduction.

Feelings, Muriel. Moja Means One. Illustrated by Tom Feelings. New York: The Dial Press, 1971.

II - HR Numbers from one to ten given in Swahili. Beautiful illustrations of African scenes depict a set of objects for each number. The numeral, the Swahili word and the pronunciation are given for each.

Hoban, Tana. Count and See. New York: The Macmillan Company, 1972.

I - HR Black and white photographs of city scenes. Numeral, number name, set of dots and picture for 1 through 20, then 30, 40, 50 and 100. Excellent photography would be appealing to children.

Little, Mary E. 1, 2, 3 for the Library. New York: Atheneum, 1974.

I - HR Children arrive for story hour in the library. Numerals and squares keep track of the total number after each arrival. Numbers from one to eleven. Delicate drawings of children.

Livermore, Elaine. One to Ten, Count Again. Boston: Houghton Mifflin Company, 1973.

I - HR Children count animals in delicate line drawings. Exercises in figure-ground discrimination. Second half involves finding several numbers in the same picture. Enjoyable way to practice counting with clever pictures.

Maestro, Giulio. One More and One Less. Illustrated by Giulio Maestro. New York: Crown Publishers, 1974.

I - HR Adding one and subtracting one shown through comic pictures of animals. Pictures simple and clearly represent the operation on sets. A word and number sentence describes each picture.

O'Brien, Thomas C. Odds and Evens. Illustrated by Allan Eitzen. New York: Thomas Y. Crowell Company, 1971.

I - HR Introduction to odd and even numbers less than 10. Good development of concept with clear illustrations. Clever reasons for wanting odd or even numbers on various occasions are suggested. Child is asked to determine odd and even numbers with various parts of the body.

Reiss, John J. Numbers. Scarsdale, New York: Bradbury Press, 1971.

I - R Counting book with large colorful pictures. Numbers 1-20, 30, 40 . . . 100, 1000 shown. Unambiguous pictures. Larger numbers may be too advanced for actual counting but will give an idea of relative size.

The Sesame Street Book of Numbers. Created in cooperation with the Children's Television Workshop. New York: Preschool Press, 1970.

I - HR Numbers one through ten introduced with numeral and pictures of sets. No text. Ends with television screens showing countdown from 10 to 1. Humorous drawings.

Whitney, David C. Addition. Illustrated by Harriet Sherman. New York: Franklin Watts, Inc., 1966.

I - R Beginning of "Let's find out about" series. Addition related to number of members in sets. Number line explained. Basic facts to 18 given on chart.

Wildsmith, Brian. Brian Wildsmith's 1, 2, 3's. New York: Franklin Watts, Inc., 1965.

I - R Numerals, number names and pictures given for 1 through 10. Very colorful, mosaic-like pictures. Asked to count objects on last few pages. Sometimes color and multi-faceted shapes make it confusing to follow the directions. Attractive cubistic illustrations.

Intermediate

Adler, David A. Base Five. Illustrated by Larry Ross. New York: Thomas Y. Crowell Company, 1975.

II - R Simple explanation of how to count in base five using objects, fingers and tallies. Changing from base five to base ten and comparing numbers in both bases. Also, shows how any number can be used as the base of a number system. Good illustrations. Heavy reliance on written explanations.

Adler, Irving. Integers. New York: The John Day Company, 1972.

II - HR Introduction to integers through games, thermometer, number line, atoms and money. Reader constructs slide rule. Rules for addition and subtraction given. Very thorough treatment of subject matter. Absolute value discussed. Should be digested over period of time. Black and white diagrams appropriate for older students.

Adler, Irving. Magic House of Numbers. Illustrated by Ruth Adler. New York: The John Day Company, 1957.

II - R Puzzles with numbers accompanied by an explanation of how they work. Topology puzzles, card tricks, and finger multiplication are illustrated. Tower of Hanoi and Oware rules are explained. Also includes a section on how to construct various games.

Adler, Irving. Magic House of Numbers. Illustrated by Ruth and Peggy Adler. New York: The John Day Company, 1965.

II - R Number patterns in learning multiplication facts and other curiosities to shorten computation time presented. Geometric (figurate), perfect, and amicable numbers described. Number puzzles, topology games and mind reading tricks shown and others. Traditional games of Nim, Oware, described.

Adler, Irving and Ruth. Numbers Old and New. Illustrated by Peggy Adler. New York: The John Day Company, 1960.

II - R Traces development of number and place value through Australian groups, Egyptian hieroglyphics, Greek, Roman, Hebrew and Arabic systems. Reasons for lucky and unlucky numbers are described. Special numbers described: square, triangular, perfect and amicable. Number games and tricks will amuse students. Interesting informational background on wide range of number concepts.

Adler, Irving and Ruth. Numerals. New York: The John Day Company, 1964.

II - R Discussion of numerals as named by many numbers. Place value and different bases examined. Gives shortcut for converting to other bases. Operations and tables shown for other bases.

Andrews, F. Emerson. Numbers, Please. Illustrated by Aldren A. Watson, Boston: Little, Brown and Company, 1961.

II - HR Interesting stories and information about numbers. Unusual ways to do computation and number tricks to try. Fraction and decimal meanings and other oddities described. Other bases, using cards, are demonstrated in base 2 and base 12. Number relationships cited which point to structural principles and patterns in math.

Asimov, Isaac. How Did We Find Out About Numbers? Illustrated by David Nevins. New York: Walker and Company, 1973.

II - HR Readable account of development of numbers. Word derivations included. Chapter on relationship of numbers and alphabet leading to the nonscientific nonsense study of numerology with such beliefs as good and bad luck numbers. Humorous pictures show simplicity and logic of Hindu-Arabic system.

Asimov, Isaac. Realm of Numbers. Illustrated by Robert Belnore. Boston: Houghton Mifflin Company, 1959.

II - HR Topics include: invention of numbers, multiplication using distributive property, fractions as broken numbers, breakage by tens or decimal numbers, figurate numbers, roots, logarithms. Word derivations are given with historical background of invention of mathematical concepts.

Barr, George. Entertaining With Number Tricks. Illustrated by Mildred Waltrip. New York: McGraw-Hill Book Company, 1971.

II - R Number tricks with an introduction on showmanship. Secret codes, unusual ways to add, and card tricks included. Magic squares and guessing games illustrated. Ends with short one sentence riddles.

Bendick, Jeanne. Names, Sets and Numbers. New York: Franklin Watts, Inc., 1971.

II - HR Distinguishes between number and numeral through discussion of names. Relates sets to scientific classification. Demonstrates usefulness of sets. Many cardinal number activities. Reader is left considering the biggest possible set he can think of.

Bendick, Jeanne and Marcia Levin. Take a Number. New York: McGraw-Hill Book Company, 1961.

II - HR Describes first numeration systems. Illustrates use of abacus. Activities use other bases. Very large and very small numbers as well as special numbers (perfect, square, negative, Fibonacci) introduced to reader. Activities involving shortcuts and tricks for computation and patterns. Simple drawings help explain concepts.

Charosh, Mannis. Number Ideas Through Pictures. Illustrated by Giulio Maestro. New York: Thomas Y. Crowell Company, 1974.

II - HR Patterns, sums and tests for odd and even numbers shown. Square and triangular number patterns and their sums introduced. Activities for student to develop concepts. Pictures illustrate well square and triangular aspects of numbers.

Cutter, Ann. Instant Math. Garden City, New Jersey: Doubleday and Company, Inc., 1962.

II - R Proponent of Trachtenberg Speed System of Basic Mathematics. Describes how multiplication and computations can be quickly done through knowledge of patterns. Practice with multiplying up to 12 times any large number and adding long columns of multi-digit numbers. These methods can lead to exploration of other patterns in mathematics.

Dilson, Jesse. The Abacus. illustrated by Angela Pozzi. New York: St. Martin's Press, 1968.

II - R History of development of numbers from different ancient cultures. Tells how abacus works and how to do all kinds of computation on it. Shows how to make your own. Good for historical insight into Chinese use of abacus paralleling European reliance on paper and pencil.

Froman, Robert. Less Than Nothing Is Really Something. New York: Thomas Y. Crowell Company, 1973.

II - HR Introduction to negative numbers. Simple everyday examples given including money, temperature, countdowns and ocean depths. Counter and number lines used to play games. Illustrations give vivid, clear pictures of meaning of negative numbers.

Froman, Robert. Venn Diagrams. Illustrated by Jan Pyk. New York: Thomas Y. Crowell Company, 1972.

II - HR Shows how to use Venn diagrams to sort and keep track of information. Introduces intersection of sets. Gives activities for reader. Solves mystery with detective work through Venn diagrams. Interesting approach to practical application of set intersection. Many examples of use from everyday lives.

Lauber, Patricia. The Story of Numbers. Illustrated by Mircea Vasiliu. New York: Random House, 1961.

II - R Simplified account of history of numbers. Contributions of various peoples cited. How numbers got their word names described. Charts big numbers and their names up to 63 zeroes. Abacus operations demonstrated.

Linn, Charles F. Estimation. Illustrated by Don Madden. New York: Thomas Y. Crowell Company, 1970.

I - HR How to make good estimates. Importance of estimating. Describes people who estimate in jobs. Gives situations for reader to estimate. Informative illustrations. Contributes to students' understanding of estimation.

Luce, Marnie and A. B. Lerner. Infinity. Illustrated by Charles Stenson. Minneapolis: Lerner Publications Company, 1969.

II - HR Infinity described as one of the basic assumptions of mathematics. Zeno's paradox illustrated. Continuous and denumerable infinite sets distinguished. The relationship of infinity to understanding the science concepts of time, space, matter and energy drawn. Excellent introduction to a difficult concept.

Luce, Marnie. Ten. Illustrated by Charles Stenson. Minneapolis: Lerner Publications Company, 1969.

I - R Advantages of base ten contrasted with others. Shows how to make fingers into a multiplication machine. Illustrates use of abacus for place value, addition and subtraction. Multiplication as repeated addition and division as repeated subtraction shown. Relationship between place value and decimals given. The odometer and money used in real world examples of place value. Many problems to solve with answers in back.

Luce, Marnie. Zero Is Something. Illustrated by Charles Stenson. Minneapolis: Lerner Publications Company, 1969.

I - R The importance of the invention of zero as a place holder by the Hindus described. Zero shown to express other ideas also: cardinal number of an empty set, additive identity, a factor and an integer. Illustrations good. Note to parent and teacher explaining concepts.

Razzell, Arthur G. and K. G. O. Watts. Three and the Shape of Three. Garden City, New Jersey: Doubleday and Company, Inc., 1969.

II - HR Interesting historical and magical uses of 3 are discussed. Types and uses of triangles for rigidity and making other shapes demonstrated. Triangular numbers and base 3 explored for patterns. Diagrams useful in explaining text. Could lead to student exploration of another number in similar vein.

Russell, Solveig Paulson. One, Two, Three and Many. Illustrated by Margot Tomes. New York: Henry Z. Wolock, Inc., 1970.

II - HR How need for numbers developed. The naming of numbers described. How first numbers were written. The need for counting by approximation shown. Development of counting tools: abacus, calculator, computer followed. Informative drawings.

Sitomer, Mindel and Harry. How Did Numbers Begin? Illustrated by Richard Cuffari. New York: Thomas Y. Crowell Company, 1976.

II - R Chronological development of how man learned to count from matching and more than and less than relationships. Some numbers named by parts of the body: eyes for two, fingers for five. The next step was putting numbers in order. Finally, number names matched with an ordered set. This is counting. Very good illustrations. Good for sense of historical appreciation.

Sitomer, Mindel and Harry. Zero Is Not Nothing. Illustrated by Richard Cuffari. New York: Thomas Y. Crowell, 1978.

I - R Illustrates importance of zero in temperature, linear measurement and place value and as a starting point.

St. John, Glory. How to Count Like a Martian. New York: Henry Z. Walck, Inc., 1975.

II - HR Shows there is not only one way to count and Martians not the only ones who do it differently. Several earthling groups counted in ways other than ours, too. Illustrations are from the Egyptians, Babylonians, Mayans, Greeks, Chinese, and Hindus. How to count like an abacus and a computer also included. Introduction to history of numbers and other bases.

Trivett, John V. Building Tables on Tables. Illustrated by Giulio Maestro. New York: Thomas Y. Crowell Company, 1975.

II - R Relationship among addition, subtraction and multiplication shown through use of pebbles and WEBS. Commutative property described as reverse. Multiplication tables given in rectangular, triangular and circular forms. Tables of triple products indicate endless variations on multiplication tables. Lack of parentheses could lead to some confusion. Diagrams clarify test.

Weiss, Malcolm E. 666 Jellybeans! All That? Illustrated by Judith Corwin. New York: Thomas Y. Crowell Company, 1976.

II - R An introduction to algebra. Shows how to solve puzzles through arithmetic sentences with unknowns. Very simple discussion. No reasons offered for what doing. A small number of examples given.

Whitney, David C. Numbers and Numerals. Illustrated by Anne Marie Jauss. New York: Franklin Watts, Inc., 1973.

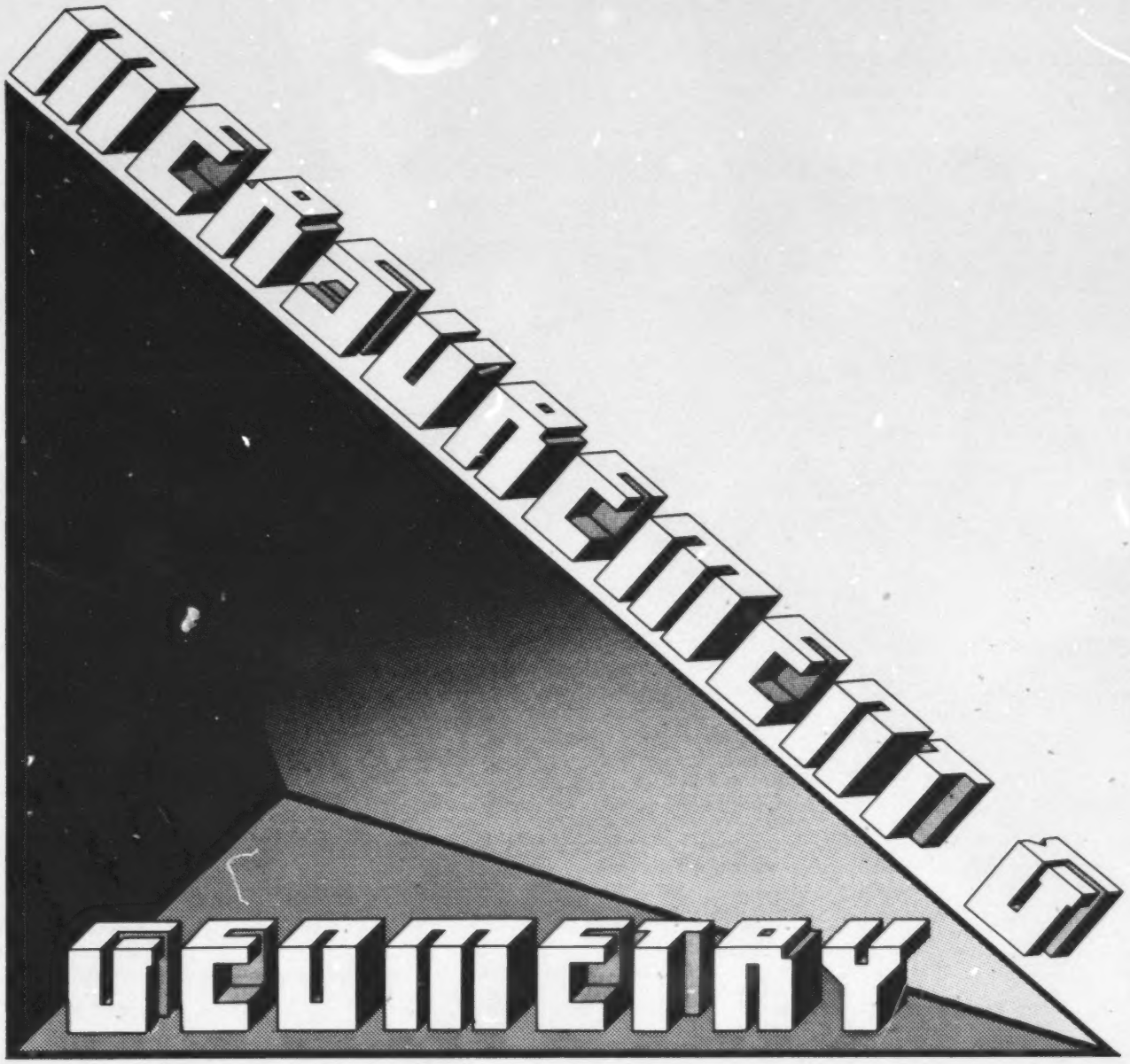
II - R Tries to make distinction between number and numeral. Egyptian, Greek, Roman and other ancient systems described. Idea of place value and bases discussed. Several problems to do with answers given. Explanation not always clear.

Whitney, David C. Sets. Illustrated by Tony Forde. New York: Franklin Watts, Inc., 1972.

II - R Symbolism for set notation introduced. Finite distinguished from infinite. Empty, null, equal, equivalent sets shown. Union and intersection with set notation used. Symbolic introduction. Should follow many concrete experiences.

Wyler, Rose and Gerald Ames. Funny Number Tricks. Illustrated by Stubis Talivaldis. New York: Parents' Magazine Press, 1976.

II - HR A series of magic tricks using numbers, dominoes, cards and other props. Clever riddles for numbers to make students think. Can also be used by teacher or parent to make children think logically. Humorous pictures.


GEOMETRY

Publishing Company, Inc., 1974.

I - R Circle, triangle, square.

Hoban, Tana. Push, Pull, Empty, Full. New York: Macmillan Publishing Company, Inc., 1972.

I - R Opposites.

Kohn, Bernice. How High Is Up? Illustrated by Jan Pyk. New York: G.P. Putnam's Sons, 1971

I - HR High, low, bottom, big, small.

Lionni, Leo. Inch by Inch. New York: Astor-Honor, Inc., 1960.

I - HR Inches.

Reiss, John J. Shapes. Scarsdale, New York: Bradbury Press, Inc., 1974.

I - R Squares, cubes, triangles, pyramids, circles, spheres, rectangles, ovals, pentagons, hexagons, octagons.

COMPUTERS AND CALCULATORS

Primary

Halacy, D. S. What Makes a Computer Work? Illustrated by Nat Goldstein. Boston: Little, Brown and Company, 1973.

II - R Simplified account of history of computers. Binary system explained. Storage systems and memory grids made of magnetic cores described. Various input units illustrated: punch cards, tapes, typewriters, radio and telephone messages, and light pens on a screen. Output systems, including the operation of machines mentioned. The role of the programmer, computer language and flow charts shown. Also provides list of places where computers are used.

Intermediate

DeRossi, Claude J. Computers, Tools for Today. Chicago: Children's Press, 1972.

II - HR General picture of what computers are and what they can do. Describes punch card and magnetic tape processes. Gives introduction to base two with examples of how computer adds. Some practice with flow charting and debugging programs. A thorough introduction to field of computers.

Goldreich, Gloria and Esther. A Computer Scientist. Photographs by Robert Ipcar. New York: Lothrop, Lee and Shepard Company, 1979.

II - R Describes background training and job of computer scientist. Computer operators, programmers, librarian and systems analyst shown at work.

Olney, Ross and Pat. Pocket Calculator Fun and Games. Illustrated by Gretchen Lopez. New York: Franklin Watts, Inc., 1977.

II - R Simple but thorough description of how calculators work. Begins with chain operations and generalizing patterns. Gives riddles using calculator alphabet. Games described for one, with cards, and for two or more.

Pallas, Norvin. Calculator Puzzles, Tricks and Games. Illustrated by Joyce Behr. New York: Sterling Publishing Company, Inc. 1976.

II - HR Various worthwhile puzzles and games to motivate students to think about why they work. Patterns explored. Many upside-down messages. Humorous illustrations.

Reit, Seymour. Round Things Everywhere. Illustrated by Carol Basen. New York: McGraw-Hill Book Company, 1969.

I - HR Circles.

Schlein, Miriam. Fast Is Not a Ladybug. New York: William R. Scott, Inc., 1953.

I - R Fast, faster, slow, slowly, more.

Shapur, Fredun. Round and Round and Square. New York: Abelard-Schuman, 1965.

I - R Circle, square, rectangle, triangle.

Tresselt, Alvin. How Far Is Far? Illustrated by Ward Brackett. New York: Parents' Magazine Press, 1964.

I - R Far, deep, high, big.

Tudor, Tasha. Around the Year. New York: Henry Z. Walck, Inc., 1957.

I - R Months.

Primary

Behrens, June. Metric Measurement. Illustrated by Tom Dunnington. Chicago: Children's Press, 1975.

I - R Brief history of measurement and metric system. Discusses meter, centimeter, kilometer, gram, kilogram, megagram, liter, milliliter, and Celsius. Gives approximate measurements of everyday objects to describe each. Chart of symbols and relationships.

Branley, Franklyn. How Little and How Much. Illustrated by Byron Barton. New York: Thomas Y. Crowell Company, 1976.

II - HR An introduction to the many kinds of scales. The imprecision of a "like" scale discussed. Brief history of how Fahrenheit set up his scales for measuring temperature given. The Fahrenheit and Celsius scales are used in experiments.

Epstein, Sam and Beryl. Who Needs Holes? Illustrated by Tomie De Paola. New York: Hawthorn Books, Inc., 1970.

I - R Introduction to circles through holes in real world situations. Practice also given in counting holes. Many uses of circles pointed out. Simple illustrations complement text. Indoor and outdoor activities to discover holes.

Fey, James T. Long, Short, High, Low, Thin, Wide. Illustrated by Janie Russell. New York: Thomas Y. Crowell Company, 1971.

I - HR Nonstandard units used to measure objects. Cubits, palms, feet, inches described historically. Shows how introduction of metric system became widespread because it was so easy to use. Meters, centimeters, kilometers used to measure. Helpful illustrations.

Freeman, May. Finding Out About Shapes. Illustrated by Bill Morrison. New York: McGraw-Hill Book Company, 1969

II - R Description of basic plane shapes--circle, oval, square, rectangle, triangle--and three-dimensional figures--sphere, cube, cone, pyramid. Lines, parallel lines and planes also discussed. Numerous examples from real world situations of above concepts. Illustrations enhance text.

Froman, Robert. Bigger and Smaller. Illustrated by Giolia Fiammenghi. New York: Thomas Y. Crowell Company, 1971.

I - HR Demonstrates the relativity of words like big and small. Shows need for comparison. Also gives examples from statistics about athletes, animals, cities and world records. Humorous drawings entertaining. Vocabulary level well beyond mathematical content level. Raises several questions for students to ponder.

Podendorf, Illa. Shapes, Sides, Curves, and Corners. Illustrated by Frank Rakoncay. Chicago: Children's Press, 1970.

II - HR Two-dimensional shapes shown in three-dimensional objects. Cones, cubes, spheres, cylinders described. Activities include observing shapes in everyday objects. Finding the dominant shape in living things leads to an explanation of drawing pictures. Relates nature, art and math.

Papy, Georges and Frederique. Graph Games. Illustrated by Susan Holding. New York: Thomas Y. Crowell Company, 1974.

II - R Introduction to graphing relations. Shows how to use diagrams of sets to show interrelationships among members. Student would need prior explanation or help in getting started with diagrams.

Reit, Seymour. Round Things Everywhere. Illustrated by Carol Basen. New York: McGraw-Hill Book Company, 1969.

I - R Photographs of child noting the circular shapes in his environment. Simple text. Appropriate for early childhood reading.

The Sesame Street Book of Shapes. New York: Little, Brown and Company, 1970.

I - R Sesame Street characters introduce shapes of circles, squares, rectangles, triangles through photographs and drawings. Many examples from the environment. Plane shapes related to solid shapes. A note to adults describes how to introduce geometry to children.

Shapp, Martha and Charles. What's Light and What's Heavy. Illustrated by Ida Scheib. New York: Franklin Watts, Inc., 1961.

I - R Illustrations of light things and heavy things. Points out some things light for some people but heavy for others. Things can be too heavy for children or adult or two adults. Shows necessity for machines to lift some things. Shows how balancing on stick or mobile can help determine which is heavier. For exact measurement explains must use scales. Very simple pictures.

Srivastava, Jane. Weighing and Balancing. Illustrated by Aliki. New York: Thomas Y. Crowell Company, 1970.

II - HR Weighing exercises begin with imprecise feeling, constructing a mobile, and balancing people on a seesaw. Shows how to make several kinds of pan balances. Explains how a set of weights can help measurement become more precise. The last experiment shows which things float.

Trivett, Daphne. Shadow Geometry. Illustrated by Henry Roth. New York: Thomas Y. Crowell Company, 1974.

II - HR From observing and tracing shadows of themselves, students cut out geometric shapes. How to make shadow screens and observe different patterns that can be made with each one. Shows guessing game of which shadows made by which objects. Good intuitive introduction to distortions and projective geometry.

Intermediate

Bendick, Jeanne. Shapes. New York: Franklin Watts, Inc., 1968.

II - R Encourages students to look for shapes around them. concepts introduced: sphere, length and width, various polygons, cones, cylinders, spiral, helix, polyhedra. Many activities to make models, draw shapes and collect objects. Bilateral symmetry examined. Ends by asking reader to imagine four dimensions. Unattractive drawings.

Bendick, Jeanne and Marcia Levin. Take Shapes, Lines and Letters. New York: McGraw-Hill Book Company, 1962.

II - R General view of areas of geometry and its relationship to science, art, music, geography, nature. Polygons and solid figures described. Also sections on graphing, simple algebraic equations, topology and secret codes. Numerous pictures illustrate topics discussed. Many topics suggested may be good introduction to other in-deph studies in areas of interest.

Branley, Franklyn M. Think Metric! Illustrated by Graham Booth. New York: Thomas Y. Crowell Company, 1972.

II - R Traces evolution of measurements from arbitrary to standard units for: time, length, volume, temperature and weight. By tracing history, shows advantages of metric system. Measurement activities include conversion, measuring common objects.

Charosh, Mannis. The Ellipse. Illustrated by Leonard Kessler. New York: Thomas Y. Crowell Company, 1971.

II - HR Illustrates how different perspectives or crosssections change circles into ellipses. Several good activities for making ellipses. Introduction of hyperbolas and parabolas with flashlight beam. Drawing faces related to ellipses. Illustrations an integral part of book.

Charosh, Mannis. Straight Lines, Parallel Lines, Perpendicular Lines. Illustrated by Enrico Arno. New York: Thomas Y. Crowell Company, 1970.

I - HR Environmental examples of straight, parallel and perpendicular lines. Concept of collinear points introduced. Many activities for students to test lines in real world situations. Checkerboard used as model. Drawings illuminate text.

Diggins, Julia E. String, Straightedge and Shadow. Illustrated by Corydon Bell. New York: The Viking Press, 1965.

II - R Simplified history of development of geometry. Contributions of various civilizations traced, beginning with prehistoric man. Interesting accounts of how geometric shapes used in architecture, witchcraft, navigation, music, mythology, war strategy and art. Drawings illustrate text well.

Ellison, Elsie C. Fun With Lines and Curves. Illustrated by Susan Stan. New York: Lothrop, Lee and Shepard Company, 1972.

II - HR Shows how to construct beautiful string sculptures, curve stitching and line drawings. Introduces tools (protractor, compass, straightedge) and measuring angles. Begins with simple constructions. Through excellent illustrations leads from simple curves to achievement of a three-dimensional effect.

Fogel, Barbara R. What's the Biggest? Illustrated by Barbara Wolff. New York: Random House, 1966.

II - R Description and statistics about biggest living things: animal, bird, insect, domestic animal, human being, etc. Man-made biggest things include: buildings, tunnels, bridges. Earth and universe records include natural phenomena with comparisons to man-made objects. Gives readers perspective on relative sizes. Suggests other books for more information. Has appeal of world records book.

Froman, Robert. Angles Are Easy as Pie Illustrated by Byron Barton. New York: Thomas Y. Crowell Company, 1975.

I - R Environmental examples of where to find angles. Experiment given to show three angles of triangles equal to 180 degrees. Introduction to terms for polygons up to eight sides. Relates hours on clock to angles. Differentiates between big and little angles.

Froman, Robert. Rubber Bands, Baseballs and Doughnuts. Illustrated by Harvey Weiss. New York: Thomas Y. Crowell Company, 1972.

II - HR Introduction to topology. Illustrations show invariants, distortions, simple closed curves and solid object shapes. Definition of topology simply explained with examples. Leaves the student thinking of things belonging to an even higher genus. Humorous cartoon pictures accompany illustrations.

Holt, Michael. Maps, Tracks, and the Bridge of Konigsberg. Illustrated by Wendy Watson. New York: Thomas Y. Crowell Company, 1975.

II - HR Introduction to networks, one aspect of topology. Several activities for making and tracing networks. Euler's classic bridge problem solved. Illuminating pictures.

Juster, Norton. The Dot and the Line. New York: Random House, 1963.

II - HR The romantic feelings of a line for a dot are depicted in this mathematical fable. The line describes its importance in the world to no avail. Finally, he turns himself into a beautiful ellipse, circles and complex curves and easily overwhelms the dot. Very clever story and excellent illustrations.

Luce, Marnie. Measurement. Illustrated by Charles Stenson. Minneapolis: Lerner Publications Company, 1969.

II - R Traces history of measurement and need for standardization. Approximate measure, estimates, precision and degree of tolerance discussed. Cites advantages of metric system. Vocabulary level high. Good pictures. No experiments. Some statements about the United States and metric system are dated.

Luce, Marnie. Points, Lines and Planes. Illustrated by Charles Stenson. Minneapolis: Lerner Publications Company, 1969.

I - R Definitional, abstract approach to plane geometry. Vocabulary level high. Many problems to solve with answers in back. Close resemblance to textbook approach. Line segments, lines, rays, simple closed curves, quadrilaterals defined. Notation for geometry and sets used.

Luce, Marnie. Polygons. Illustrated by Charles Stenson. Minneapolis: Lerner Publications Company, 1969.

II - R Point, segment, dimension, triangle, plane described as representations of geometric ideas. The relationship between simple closed figures and polygons shown. The Pythagorean theorem and related ideas of diagonal patterns shown. Perimeter briefly discussed. Geometric designs all around us noted.

Luce, Marnie. Polyhedrons. Illustrated by Charles Stenson. Minneapolis: Lerner Publications Company, 1969.

II - R Graphic pictures of imaginary planes are joined to form polyhedrons. Faces, edges and vertices depicted. Reader makes paper models of a cube, tetrahedron, octahedron and icosahedron (Platonic solids). Other prefixes discussed. Polyhedron in nature and man-made objects shown.

Nation, Kay and Bob. Meters, Liters, and Grams. Illustrated by Lynn Sweat. New York: Hawthorn Books, Inc., 1975.

I - R Describes how metric system came to be and why it is so popular. Familiarizes reader with units by engaging him or her in activities from measuring self to baking cookies.

Phillips, Jo. Exploring Triangles. Illustrated by Jim Rolling. New York: Thomas Y. Crowell Company, 1975.

II - HR Paper folding with triangles to illustrate various properties of angle bisectors, medians and perpendicular bisectors. Experiment to determine center of gravity. Inscribing circles within triangles demonstrated. Illustrations clarify directions for experiments.

Phillips, Jo. Right Angles. Illustrated by Giulio Maestro. New York: Thomas Y. Crowell Company, 1972.

I - R Paper folding to make models of plane figures. Testing real world objects for right angles and angles bigger or smaller than right angles. Congruent shapes and characteristics of quadrilaterals explored. Animal pictures may make books seem inappropriate for intermediate students.

Ravielli, Anthony. An Adventure in Geometry. New York: The Viking Press, 1961.

II - HR Geometry revealed through nature. Plain and solid geometric concepts discussed. Interesting section on projections and distortions. Unusual topics, such as shape of sound, and variations of basic shapes included. Will encourage reader to look for geometry in surroundings. Graphic art enhances text.

Razzell, Arthur G. and K. G. O. Watts. Circles and Curves. Illustrated by Ellen Raskin. Garden City, New Jersey: Doubleday and Company, Inc., 1968.

II - HR Many experiments demonstrate properties of circles, ellipses, spirals, parabolas, helixes, cylinders, spheres. Historical background intertwined with each introduction. Practical ramifications of principles demonstrated to illustrate reasons for shapes of man-made things in everyday lives. Simple illustrations help clarify text.

Razzell, Arthur G. and K. G. O. Watts. Symmetry. Illustrated by Ellen Raskin. Garden City, New Jersey: Doubleday and Company, Inc., 1968.

II - R Bilateral symmetry, axes and center of symmetry explored. How to paper fold symmetrical shapes shown. Rotational symmetry contrasted with bilateral symmetry. Demonstrates symmetry of solids. Poses puzzles which can be solved with a mirror. Illustrations essential.

Read, Ronald C. Tangrams. New York: Dover Publications, 1965.

II - HR Patterns of various shapes to make with tangram pieces. Puzzles range from simple to complex. Solutions provided.

Schlein, Miriam. Metric. Illustrated by Jan Pyk. New York: Harcourt, Brace, Jovanovich, 1975.

II - R Describes origins of metric system. Shows prefixes and their meanings. Gives the history of the metric system in the U.S. Gives many reasons why we should go metric. Will become dated in this respect. Lively, contemporary Peter Max-type drawings.

Sitomer, Mindel and Harry. Circles. Illustrated by George Giusti. New York: Thomas Y. Crowell Company, 1971.

I - HR Beginning constructions with compass. Radius, diameter, semicircle introduced. Several designs to make based on circles. Also includes concept of "square" corner. Illustrations enhance text.

Sitomer, Mindel and Harry. Lines, Segments, Polygons. Illustrated by Robert Quackenbush. New York: Thomas Y. Crowell Company, 1972.

I - HR Lines, points, rays, segments, angles, vertices, triangles, quadrilaterals and polygons illustrated with excellent drawings. Shows how to make and use a geoboard. Right angles, regular and irregular polygons and other geometric concepts discussed.

Sitomer, Mindel and Harry. Spirals. Illustrated by Pam Makie. New York: Thomas Y. Crowell Company, 1974.

II - HR Spirals distinguished from circles. Shows how to draw on graph paper. Depicts flat spirals in nature--flowers, snakes--and spatial spiral/helix--pine cone, plants, shells, hurricanes, water in a drain, whirlpools, the Milky Way. Shows spiral used as a simple machine; also as found in art, moustaches. Games to play on spiral boards illustrated. Pictures portray concept well.

Sitomer, Mindel and Harry. What Is Symmetry? Illustrated by Ed Emberley. New York: Thomas Y. Crowell Company, 1970.

II - HR An introduction to symmetry in man-made and natural phenomena. Bilateral, point and plane symmetry described. Activities to find axis and point of plane symmetry. Paper folding designs to make. Examples from student's immediate environment, science and alphabet shown. Drawings helpful to understanding text.

Stone, A. Harris and Bertram M. Seigel. Have a Ball. Illustrated by Peter P. Plasencia. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1969

II - R Experiments with balls relating math to basic principles in physics. Math concepts involved: diameters, angles, graphing, measurement. Applications of math and science concepts through interesting activities. Leaves reader with thought-provoking questions.

Struble, Mitch. Stretching a Point. Philadelphia: The Westminister Press, 1971.

II - R Some of topics of topology illustrated with mazes, puzzles, games and tricks. Konigsberg bridge problem and networks explored. Polyhedra models built with related problems given. Also torus, Klein bottle and Mobius strip discussed. Diagrams essential. Text appropriate for young adult.

Adult Resources

Asimov, Isaac. Realm of Measure. Illustrated by Robert Belmore. Boston: Houghton Mifflin Company, 1960.

II - HR Describes underlying theories and history of gradual refinement of measurement. Tells story of metric system and how it simplifies measurement. Highly complex units included. Formulas for physical laws explained. Quantum theory and Theory of Relativity among theories simply described. Relationship between mathematics and physics drawn.

Bendick, Jeanne. How Much and How Many. New York: McGraw-Hill, Inc., 1960.

II - R Development and explanation of units in English Standard System. Measures described for science, navigation, surveying, cooking, medicine, photography, ballistics. Metric system briefly described. Description of National Bureau of Standards. Dated in its emphasis on English Standard System.

Berger, Melvin. For Good Measure. Illustrated by Adolph E. Bratman. New York: McGraw-Hill Book Company, 1969.

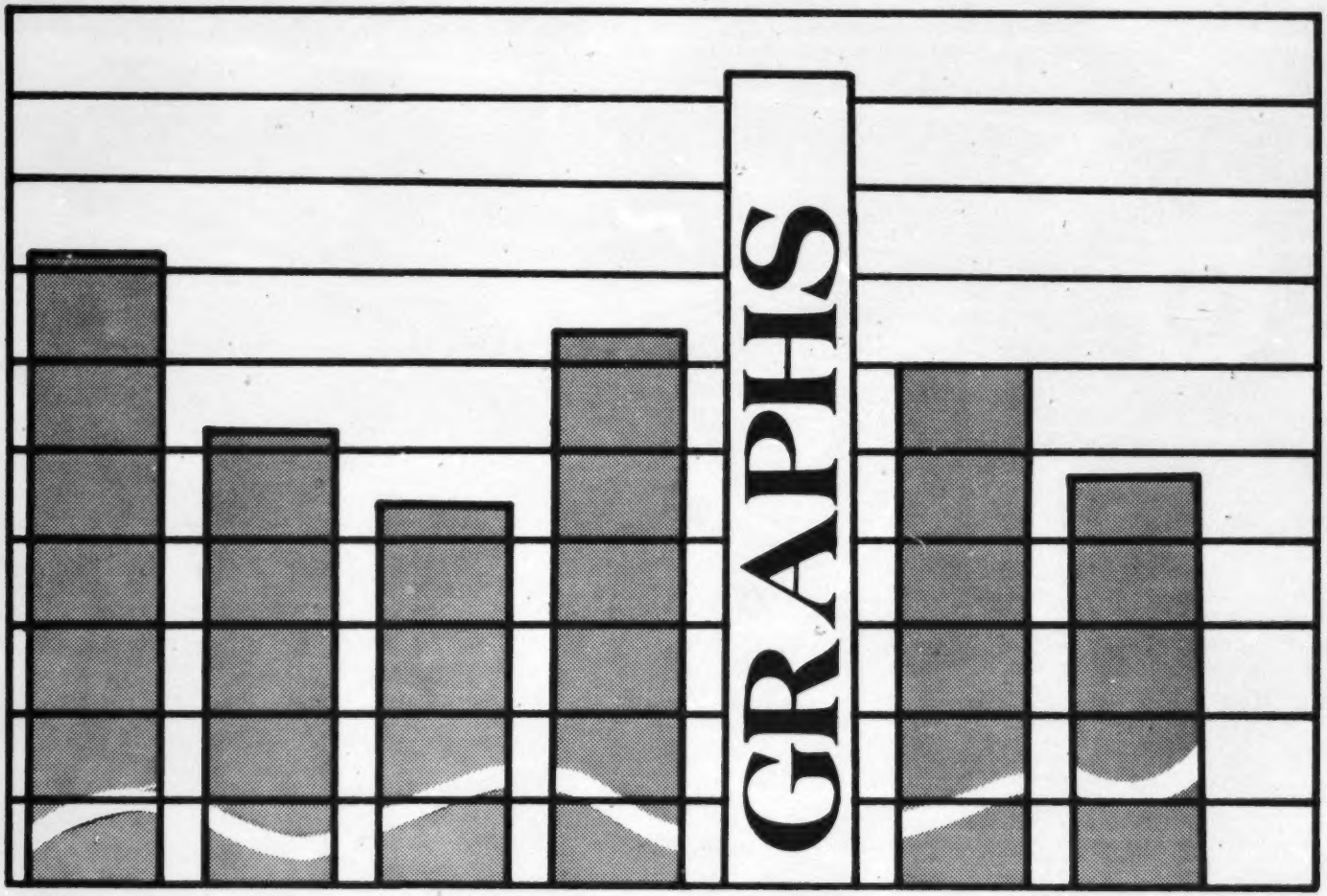
II - R Description of technological methods of measurement. Discussion of measurement instruments--laser, cesium beam clock, ultrasonic thermometer--to describe the accuracy of today's measurement devices. Points out that every scientist is partly a measurement scientist. Measurement also necessary for industry as well as every individual. Discusses measurement of: length, mass, time, temperature, sound, light, electricity and radiation.

Hirsch, S. Carl. Meter Means Measure. New York: The Viking Press, 1973.

II - R Interesting historical account of problems of metric adoption in U.S. from Jefferson to Adams to present with the backdrop of European development and acceptance. Discusses lack of standard measures at National Bureau of Standard until 1900s. Shows how international scientific, athletic and industrial communities finally establish need for world-wide system. Explains various units. The necessity to learn by doing stressed.

Linn Charles F. Odd Angles. Garden City, New York: Doubleday and Company, Inc., 1971.

II - HR Contains a collection of essays and other excerpts from literature including selections by Carl Sandburg, Ben Franklin, Mark Twain, Art Buchwald and Lewis Carroll. Assimov, Linn and others recount stories related to mathematics. Quatrains and limericks reproduced. Designed for those who are disinclined toward mathematics.



Functions & Probability

Intermediate

Linn, Charles F. Probability. Illustrated by Wendy Watson. New York: Thomas Y. Crowell Company, 1972.

II - HR Ideas about probability, graphing, sampling introduced. Importance of good recordkeeping stressed. Shows how to make predictions. Depicts value of increasing amounts of data. Gives probability experiments for reader. Humorous illustrations show students what to do. Good introduction to probability and statistics.

Lowenstein, Dyno. Graphs. New York: Franklin Watts, Inc., 1969.

II - R Shows ways to construct various kinds of graphs: line, bar, circle and pictographs. Includes section on how to lie with graphs and statistics. Illustrates well the importance and practical significance of graph making. Good practice with real-world graphs. Would work on over period of time.

Razzell, Arthur and K. G. O. Watts. Probability. Illustrated by Ellen Raskin. Garden City, New York: Doubleday and Company, Inc., 1967.

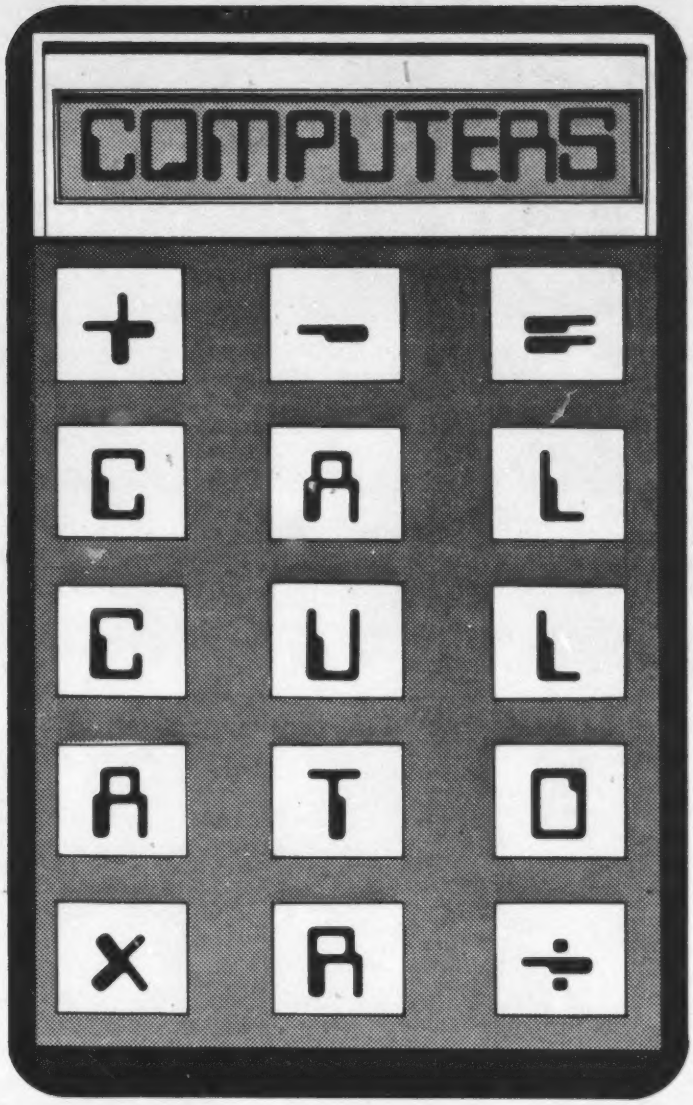
II - R Introduces prediction of future events. Coin tossing depicts the discrepancy between long and short run experiments. Random samples and polls described for those things that cannot be counted. How to count large numbers explained with interesting anecdote on Xerxes counting his army. Several experiments to conduct. Explains how insurance is determined by probability. Beginning notion of normal curve given through measure of population's shoe size.

Srivastava, Jane. Averages. Illustrated by Aliki. New York: Thomas Y. Crowell Company, 1975.

II - HR Description of the average as the mean, median or mode. The most appropriate time for using each is discussed. Motivating activities to show how each is found. Illuminating pictures. Students are left with the question, "Are you an average person?" Shows how everyone is both average and different in some ways.

Srivastava, Jane. Statistics. Illustrated by John J. Reiss. New York: Thomas J. Crowell Company, 1973.

II - HR Describes sampling through involvement in an experiment. Tells how to take a poll and record information on a bar, circle, line or picto-graph. The utility of statistics for supermarkets, car makers and advertisers pointed out. Shows how to lie with statistics and how they can be misleading. Many activities.


COMPUTERS
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Ray, Jo Anne. Careers in Computers. Illustrated by Milton J. Blumenfeld. Minneapolis: Lerner Publications Company, 1973.

II - R Photographs and simplified one-page explanations of computer-related jobs. Occupations include different types of engineers, programmers, operators, assemblers and instructors. Could be used in conjunction with social studies and career information.

Srivastava, Jane J. Computers. Illustrated by James and Ruth McCrea. New York: Thomas Y. Crowell Company, 1972.

II - HR Introduction to vocabulary of computers: input unit, data, program, FORTRAN, arithmetic unit, memory bank, printout, control unit. Practice is given with following and producing flow charts. Colorful pictures add to the understanding of text.

Steinberg, Fred J. Computers. New York: Franklin Watts, Inc., 1969.

II - R Brief history and explanation of how computers work. Most of book devoted to areas in which computers used and how used. Examples include: business, government, space programs, IRS, medicine and education. Many of the projections of use for these areas have already been realized. Most background information on basic computer uses in these fields still valid. Photographs enhance text.

Adult Resources

Berger, Melvin. Those Amazing Computers. New York: The John Day Company, 1973.

II - HR Brief explanation of computers. Account of many ways in which used for space and air travel, weather, government, TV, police departments, industry, medicine. Some problems such as invasion of privacy discussed. Possible use in the future of education, the sciences, libraries, literature, archeology, games, sports and music projected.

Cohen, Daniel. The Human Side of Computers. New York: McGraw-Hill Book Company, 1975.

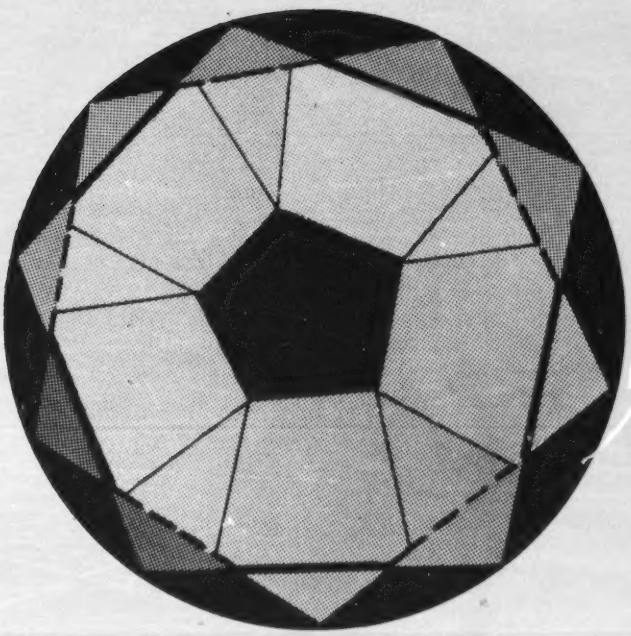
II - HR Balanced discussion of reasons people distrust computers. Points out that as computers become more complex they are easier to operate. Several incidents in crime, polling, wartime strategy, computerized dating cited to show positive and negative aspects of computers. Author urges a confrontation with computers. Contrary to popular belief, suggests computers have made human more, not less, important because of the potential power of decisions.

Rusch, Richard B. Computers: Their History and How They Work. New York: Simon and Schuster, 1969.

II - HR Thorough treatment of how computers work. Current and future applications discussed. Some of facts about computer technology need updating. Figures on throughput time, input and output mechanics as well as course and job opportunities have changed during the past ten years. With these shortcomings in mind the reader still gets a good background of computer language, basic hardware and our increased dependence on computers.

Schlossberg, Edwin, John Brockman and Lyn Horton. The Home Computer Handbook. New York: Sterling Publishing Company, Inc., 1978.

II - HR What computers are and how they work described. Also includes glossary, bibliography and buying guide.



GENERAL

GENERAL

Primary

Anno, Mitsumasa. Topsy-Turvies. New York: Weatherhill, 1970.

II - HR Intriguing pictures to identify what is wrong. Find mathematical impossibilities. Stretches imagination. Optical illusions. Very motivating.

Anno, Mitsumasa. Upside-Downers. New York: Weatherhill, 1971.

II - HR Picture puzzles which require visual descrimination and changing perspective. Indirect approach to concepts in geometry and topology as well as positional vocabulary such as upside-down, etc. Excellent pictures.

Charosh, Mannis. Mathematical Games for One or Two. Illustrated by Lois Ehlert. New York: Thomas Y. Crowell Company, 1972.

II - HR Mathematical puzzles and games to play with cards, checkers and marbles. Clear, simple directions with drawings to illustrate. Games described which reinforce addition and subtraction facts as well as introduce strategy of game playing.

Gillespie, D. Craig. Weeple People. Illustrated by Garry Clark Hamilton. New York: McGraw-Hill Book Company, 1972.

II - HR Has children distinguishing attributes of people. Many exercises with answers explained. Amusing names and humorous illustrations.

Peppe, Rodney. Odd One Out. New York: The Viking Press, 1974.

II - HR Big, colorful pictures with something wrong in each. Discrimination exercise basic to mathematical concepts.

Intermediate

Adler, Irving. Mathematics, the Story of Numbers, Symbols and Space. Illustrated by Lowell Hess. New York: Golden Press, 1959.

II - HR General overview of mathematics. Gives relationships among various bodies of mathematics: number theory, geometry, algebra and probability. Relationships also shown between mathematics and nature, art, music, genetics and games. Even though old, has broad perspective. Valuable for student of mathematics.

Adler, Peggy and Irving. Math Puzzles. Illustrated by Peggy Adler. New York: Franklin Watts, 1978.

II - HR Filled with challenging puzzle problems and nonroutine word problems. Good source for "problem of the week" for entire class.

Barnard, Douglas. It's All Done by Numbers. New York: Hawthorn Books, Inc., 1966.

II - R Traces history of numbers. Shows development of multiplication as repeated addition and division as repeated subtraction. Advantages of decimals over fractions described. Ancient tricks and puzzles shown. Discusses notions of trigonometry. Contributions of various countries and mathematicians enumerated.

Bendick, Jeanne and Marcia Levin. Mathematics Illustrated Dictionary. New York: McGraw-Hill Book Company, 1965.

II - HR Dictionary of mathematical terms and famous mathematicians. Illustrated when appropriate. Good resource to find brief, simplified explanation of any term in mathematics.

Bergamini, David. Mathematics. New York: Time Incorporated, 1963.

II - HR Encyclopedic approach to branches of mathematics. Numbers, calculus, geometry, topology, probability among topics included. Contributions of eminent mathematicians cited. Discusses relationship of math to other fields: art, science, music, sports, nature. Emphasis on mathematical literacy for everyday lives. Excellent color photographs reinforce text. Highly motivating and interesting.

Brooks, Daniel. Numerology. Illustrated by Terry Fehr. New York: Franklin Watts, 1978.

II - R A different look at Pythagoras and applications for numbers. Points out many interesting facts. Will not offend nonbeliever.

Burns, Marilyn. The I Hate Mathematics Book. Illustrated by Martha Hairston. Boston: Little, Brown and Company, 1975.

II - HR An iconoclastic view of mathematics. In sepia and cream-colored comic strip format. Relates activities done at home and at play to mathematics. Puzzles, tricks and riddles given to try on others. Humorous suggestions such as there is more than one way to slice a banana leads into a discussion of conic sections. Highly motivating.

Feravolo, Rocco. Wonders of Mathematics. Illustrated by Robert Bartram. New York: Dodd, Mead and Company, 1963.

II - R History of numbers and measurement. Indirect measurement through similar triangles demonstrated. Rigidity of shapes related to building discussed. Points out importance of math to air and sea transportation. Directions given for constructing various objects including sundials. Illustrations aid understanding of text. Application of math to everyday life stressed.

Hogben, Lancelot. The Wonderful World of Mathematics. Garden City, New Jersey: Doubleday and Company, Inc., 1968.

II - HR Dramatic presentation of extension of man's knowledge and growing need for more sophistication in math in building, travel and exploration, time, physics, astronomy, calculations. Greek contributions to logic and proof cited. Lengthy glossary with diagrams explains terms and identifies geniuses of math. Illustrations show relationship of natural phenomena to mathematical laws.

Jonas, Arthur. More New Ways in Math. Illustrated by Aliki. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1964.

II - R More topics of "new" math of '60s discussed: measurement; cardinal numbers, numbers and numerals; bases; true/false and open sentences; identity elements; commutative, associative, and distributive laws; number lines and graphing open sentences. Many exercises to follow along with. Brief overview of topics. Emphasis on vocabulary.

Jonas, Arthur. New Ways in Math. Illustrated by Aliki. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1962.

II - R Briefly covers several areas of "new" math: history of place value, computers, missing addends, probability, topology, sets, famous mathematicians. Many pages devoted to computation in base two, including division. Most topics just cursorily mentioned.

Kadesch, Robert R. Math Menagerie. Illustrated by Mark Binn. New York: Harper and Row, 1970.

II - HR Explores many interesting constructions and puzzles relating to probability and geometry. Topological puzzles and transformations presented. Stimulates thinking about practical applications for puzzles.

Kettelkamp, Larry. Puzzle Patterns. New York: William Morrow and Company, 1963.

II - R Geometric puzzles related to mosaics. A history of puzzles from Pythagorus, Archimedes, Carroll, Newton to present day. Usefulness of puzzles illustrated in packaging problems, architecture, tools. Picture and word puzzles also included. Good illustrations.

Linn, Charles F. Puzzles, Patterns, and Pastimes. Illustrated by Lou Myers. Garden City, New York: Doubleday and Company, Inc., 1969

II - HR Many puzzles to figure out yourself or try on others. Both ancient and modern puzzles shown. Ways of avoiding direct answer but still telling the truth are suggested. Directions given for several games you can build.

McWhirter, Norris. Guinness Sports Record Books. New York: Sterling Publishing Company, Inc., 1979.

II - HR Annual sports records filled with interesting numerical facts.

O'Neill, Mary. Take a Number. Illustrated by Al Nagy. Garden City, New Yolk: Doubleday and Company, Inc., 1968.

II - HR Poetry illustrated with attractive pictures covers such diverse topics in math as numbers, place value, sets, primes, geometry, fractions, patterns, measurement. Combination of math and literature. Mathematical terms described with poetic license.

Rothman, Joel. Which One Is Different? Illustrated by Seymour Chwast and Victor Kotowitz. Garden City, New York: Doubleday and Company, Inc., 1975.

II - HR Book in which careful discrimination leads to the correct answer. Interesting drawings and photographs. Each page has a new puzzle. Solutions are given. Very good exercise to complement study of attributes.

Adult Resources

Broudy, Rose L. Modern Math Made Easy. Irvington-on-Hudson, New Jersey: Harvey House, Inc., 1970.

I - R An explanation of many of the topics found in the new math: properties, sets, bases, primes, modular arithmetic. The rationale for including each in the curriculum given. Contains a short glossary of terms and a limited bibliography of books for the family.

Holt, Michael and Zoltan Dienes. Let's Play Math. New York: Walker and Company, 1973.

I - HR Introduction on how children lean math and current philosophy of math education. Terminology of games described. Excellent suggestions to improve logical capacity of children. Games related to basic mathematics concepts of sorting and ordering described. Games with concrete objects shown, provide foundation for later math concepts of symmetry, rotation, relations, ordering, time, patterns, ratio. Games are designed to help children understand basic structure of mathematics.

Meyer, Jerome S. and Stuart Hanlon. Fun With the New Math. New York: Hawthorn Books, Inc., 1965.

I - R Rationale for new math discussed. Definitions of terms and symbols related to sets and numbers. Modular arithmetic explained. Other bases, graphing inequalities outlined. Most topics discussed being phased out of basic curriculum.

Sharp, Evelyn. A New Mathematics Reader. New York: E. P. Dutton and Company., Inc., 1968.

I - HR Designed to be read as an introduction to various branches of mathematics. Each chapter gives an overview of an area such as: sets, logic, bases, properties, probability. Very readable. Can help explain why topics are being studied.

BIOGRAPHIES & PERSONALITIES

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Primary

Lexau, Joan M. Archimedes Takes a Bath. Illustrated by Salvatore Murdocca. New York: Thomas Y. Crowell Company, 1969.

II - HR A humorous account of getting Archimedes to take a bath when more pressing matters were on his mind. When he finally does he makes his great discovery.

Nye, Robert. The Mathematical Princess. Illustrated by Paul Bruner. New York: Farrar, Straus and Giroux, 1972.

II - R King Cole's daughter is a brilliant mathematician whom he tries to marry through a contest. Anyone who could stay awake listening to her talk about Euclid would win her hand. One of several stories in this anthology.

Intermediate

Asimov, Isaac. Breakthroughs in Science. Illustrated by Karoly and Szanto. Boston: Houghton Mifflin Company, 1959.

II - HR Describes achievements of a group of scientists and mathematicians who have changed the world for mankind. Chapters on Archimedes, Galileo and Newton, in very readable format, describe how their mathematical ideas affected the advancement of science.

Cane, Philip. Giants in Science. Illustrated by Samual Nisenson. New York: Grosset and Dunlap, 1959.

II - R Pythagorus, Euclid, Archimedes and Einstein are included in this collection of famous mathematicians and scientists. Brief chapters describe their lives and achievements.

James, Elizabeth and Carol Barkin. How To Grow a Hundred Dollars. Illustrated by Joel Schick. New York: Lothrop, Lee and Shepard Company, 1979.

II - R Arithmetic calculations of a young girl who starts her own business. Economic principles illustrated also.

Latham, Jean Lee. Carry On, Mr. Bowditch. Illustrated by John Costrave II. Boston: Houghton Mifflin Company, 1955.

II - HR Biography of Nathaniel Bowditch, a navigator who taught himself mathematics and astronomy. He wrote The American Practical Navigator 150 years ago and it is still used by the U.S. Naval Academy. The story illustrates the relevance of mathematics to other fields and conveys a feeling of enthusiasm about mathematics. A Newbery Award winner.

Merrill, Jean. The Toothpaste Millionaire. Boston: Houghton Mifflin Company, 1972.

I - HR The entrepreneurial adventures of a 12-year-old boy followed through his rise in the business world. Concepts of money, profit, percentage, interest, as well as economics principles, permeate the story. Humorous scenes from math class depicted.

Stonaker, Frances B. Famous Mathematicians. Philadelphia: J. B. Lippincott Company, 1966.

II - HR Brief chapters about lives of famous mathematicians Euclid, Archimedes, Descartes, Newton, Gauss and others. Well written historical fiction. Accuracy attested to by Paul Baron of Princeton University. Readable style.

Adult Resources

Bendick, Jeanne. Archimedes. New York: Franklin Watts, Inc., 1962.

II - R Recreates times of Archimedes and suggests what his life was probably like. His theories in mathematics and science explained. Gives a list of his writings in appendix.

Harvey, Tad. The Quest of Archimedes. Illustrated by Sam Wisnom. Garden City, New York: Doubleday and Company, Inc., 1962.

II - R Description of contemporaries in Golden Age of Science. Archimedes' geometric formulas explained, as well as theories of physics.

Levinger, Elma. Albert Einstein. New York: Simon and Schuster, Inc., 1949.

II - R Biography of Einstein with focus on world events. Brief reference made to theories. Emphasis on Einstein the man.

Marcus, Rebecca B. Galileo. Illustrated by Richard Mayhew. New York: Franklin Watts, Inc., 1961.

II - R Follows the life of Galileo, listing his remarkable accomplishments. Description of telescope construction. Important dates of his life in appendix.

Peare, Catherine. Albert Einstein. New York: Holt, Rinehart, and Winston, 1949.

II - R Follows life of Einstein through his many travels. Theory of relativity simply described.

Rosen, Sidney. Galileo and the Magic Numbers. Illustrated by Harve Stein. Boston: Little, Brown and Company, 1958.

II - R Traces Galileo's life through his periods of public disfavor and favor as he attacked old theories and generated new ones. Descriptions of how he arrived at his new ideas. Sophisticated depiction of the beliefs of the times and the public reaction to Galileo's challenges.